

# YOUTH & DRUGS

AN EDUCATION PACKAGE  
FOR PROFESSIONALS

## WORKBOOK

UNIT • 2

### *Drugs and Their Use*



Health and Welfare  
Canada

Santé et Bien-être social  
Canada



Addiction  
Research  
Foundation

Fondation  
de la recherche  
sur la toxicomanie

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Unit 2

Partners in

~~~~~ **canada's**  
**drug**  
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**YOUTH AND DRUGS:  
AN EDUCATION PACKAGE FOR PROFESSIONALS**

**UNIT 2:  
DRUGS AND THEIR USE**

**WORKBOOK**

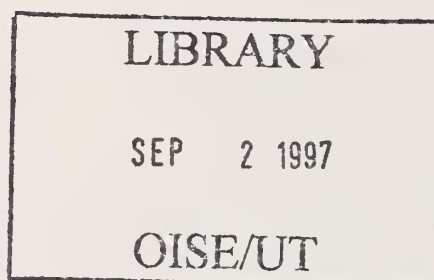
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## INTRODUCING UNIT 2

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Professionals who are unaccustomed to working with drug-using youth are often daunted by the sheer quantity of information in the drugs and addictions field. There are a great many books published in the area, many journals dedicated to it, and many learned people practising as specialists. **You do not need to achieve this kind of expertise in order to work effectively with your clients on their drug use problems.** But you do need to know a little about how drugs work, the effects of particular drugs, and the patterns of drug use that are typical of adolescents.

This Unit will present information on those three topics. After one reading, the Unit is likely to become a reference for you.

Although some of this material may at times seem “technical” or “academic”, there are good reasons for those who work with youth and drugs to have a basic familiarity with the concepts and processes of drug action. You will be a more comfortable and effective practitioner, as you will realize when you think about the goals of this Unit.

### The goals of Unit 2 are:

- to introduce you to basic drug use terminology;
- to enable you to communicate effectively with other health care professionals;
- to make you more comfortable with the literature in the field;
- to give you more confidence in your ability to talk to, and make well-founded judgements about, the young people you work with about drug use issues.

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### Goals: Unit 2

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In **Section 1**, we will define and describe some of the most critical concepts and processes of drug use. However, rather than try to give you a complete course in psychopharmacology, we will refer you to more inclusive texts for further information. Some good sources are: M.R. Jacobs and K.O. Fehr, *Drugs and Drug Abuse* (1987); R.M. Julian, *A Primer of Drug Action* (1988); W.A. McKim, *Drugs and Behaviour* (1986); and S.H. Snyder, *Drugs and the Brain* (1986). In **Section 2**, we will present descriptions of individual drug effects. We will begin by referring you to the Addiction Research Foundation's booklet **Facts About Drugs** (included in your course package) for basic information. Then we will add what we can on the specifically adolescent use of each drug. Finally, in **Section 3**, we will explore the overall patterns of use that prevail among kids today, using a question and answer format. (**Section 4** contains a glossary of drug terms.)

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**EXPECTED LEARNING OUTCOMES**

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When you have worked your way through this Unit, you will be able to:

- ☐ **use correctly** the basic terminology of drugs and their effects (e.g. dose, drug interactions, tolerance, addiction, et cetera);
- ☐ **distinguish** the basic concepts applicable to a **single drug use** from those describing the effects of **long-term use**;
- ☐ **list** the two major processes affecting the intensity of drug effects;
- ☐ **describe** three body processes that effect the concentration of a drug at its site of action;
- ☐ **define** the crucial concept of drug abuse potential;
- ☐ **list** three dimensions of variability that make the accurate analysis of street drugs impossible for the non-expert;
- ☐ **list** the four major drug classifications;
- ☐ **describe** how particular drugs are used: i.e., their common modes of administration and their uses by and effects on adolescents;
- ☐ **distinguish** between short-term and long-term effects of common street drugs;
- ☐ **communicate** the abuse potential of different drugs to young people;
- ☐ **describe** drug use prevalence patterns among Canadian youth;
- ☐ **describe** important trends in use;
- ☐ **list** thirteen so-called “risk factors” that may help you to identify youth who are using drugs.



*After you have completed this Unit, we will ask you to return to this list and check off the learning outcomes you have achieved.*

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**PREVIEW OF TOPICS TO BE COVERED IN UNIT 2**

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**Section 1: BASIC CONCEPTS OF DRUG USE**

- concepts and processes of a single use
- concepts and processes of long term use

**Section 2: DRUGS AND DRUG EFFECTS**

- identification and analysis
- drug classification
- abuse potential
- the effects of thirteen individual drugs and drug groups, listed alphabetically

**Section 3: PREVALENCE OF DRUG USE AND DRUG USE PATTERNS AMONG ADOLESCENTS**

- Is drug use increasing among high school students?
- What factors contribute to the changing rate and nature of teen drug use?
- Are there any new trends in youth substance use?
- What drugs are students most likely to be using?
- What drugs are most commonly used?
- What about other drugs? Don't kids progress from alcohol and cannabis to other substances?
- What about age and sex differences? Is it true that more girls are using drugs now?
- Are there any signals that might help to identify those young people most at risk for abuse?
- What about the adolescents who end up in treatment? Is their drug use different from that of other young people?

**Section 4: GLOSSARY OF DRUG TERMS**

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**ESTIMATED WORK TIME AND STUDY TIPS**

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The estimated study time for this Unit is **12 to 15 hours**, including the time it will take you to do the activities.

If you are already familiar with the basic terminology of drugs and addiction, you may want to skim Section 1, and concentrate on the youth specific information provided in Sections 2 and 3.

**We strongly recommend that you do all activities.** Educational research has shown that active participation by the student in his/her own learning process is more effective than passive reading, in terms of both comprehension and retention. It is particularly important in relation to Section 2, where an activity box connects background reading from the attached booklet **Facts About Drugs** to the text in the Workbook.



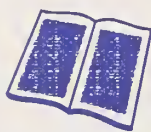
*Have your VCR and tapes ready!*

You should begin Unit 2 by viewing the second videotape in your course package. It is about twenty-five minutes long. It will show you the next episodes in the continuing stories of Cindy, Danny and Theresa — and the professionals who are trying to intervene in their drug use.

To review: Cindy has quit the school band after an angry confrontation with Mr. Peacock. Danny has run away from his small town home after a brush with inhalants and the law, and is now trying to survive on the big city streets. Theresa is heading back to school after one of her final probation appointments before the termination of her apparently successful relationship with Shelley Oakes.

In these second episodes, you will see how the professionals' knowledge about drugs and adolescent drug use — or lack of it — helps (or hinders) them in understanding and working with their young clients.

For those of you who would find it useful to see audiovisual material on specific drugs and their effects, please contact your provincial or territorial drug agency for a listing of the dozens of films and other materials that explore the use of specific drugs in detail.



*Keep your Book of Readings handy too.*

You will find supplementary information on drug effects and drug use patterns among adolescents in your Book of Readings in the chapter by Reginald Smart and Vivien Jansen, particularly in relation to alcohol, cannabis and cocaine use. Dr. Smart and his colleagues have been conducting biennial surveys of drug use among Ontario students since 1977, which provides them with rare comparisons over time.

**Questions — Videotape #2**

Below you will find the questions raised in videotape #2. There is extra space on the following page for your answers.

**“Cindy”:**

1. Do you agree with the two teachers’ assessment of Cindy’s behaviour? Review what you know about this girl, and compare your conclusions with theirs.

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2. What are the key characteristics of Daphne Dove’s approach to Cindy? What do you predict as the outcome of their interview?

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**“Danny”:**

1. What are the characteristics of the street van situation, and Bill Butler as a counsellor, that allowed Danny to trust him?

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2. In many jurisdictions, the law requires that a juvenile be sent home to get whatever help there is. Given this constraint, do you think Bill Butler and Patricia Gardiner could have done anything more or different with Danny?

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**“Theresa”:**

1. Why do you think Theresa is unable to choose herself and her future over the short-term pleasures of the moment, the way her boyfriend Steve can?

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2. What do you think she sees in her future? Do you think she should feel optimistic or pessimistic?

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**Section 1: BASIC CONCEPTS OF DRUGS AND DRUG USE**

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*In this Section, we will define basic concepts and describe basic processes of drug use. The Section is designed to answer (or review) the fundamental questions: what are drugs and what do they do? It is not youth specific.*

First, what is a drug? The Greek word *pharmakon* means both medicine and poison, a confusion of fact and attitude which is still with us today. Some “drugs” (e.g. medicines) are designed for their positive effects on the mind and/or body, but used incorrectly, they can be toxic. Other substances normally used as foods or beverages (e.g., mushrooms; alcohol) or for purposes other than human consumption (e.g. gasoline; solvents) can also have powerful effects on the mind/body.

What all these substances have in common is their capacity to change the mood, state of mind, or state of being of the user. And so we define a drug as any substance, when used to achieve such an effect.

People take drugs for one primary reason: because they change the chemistry of the central nervous system (CNS), especially the brain. The effects may be physiological, biochemical or psychological, but in all cases, drug use produces “altered states” — altered feelings, altered perceptions, even altered capacities.

At what point does this alteration become drug abuse? The phrase “drug abuse” is really a value judgement rather than a scientific term. The distinction between socially acceptable use, dangerous use, and what counts as “abuse” varies with time and place and cultural context. However, the American Medical Association defines drug abuse as:

*... the ingestion of a psychoactive substance that is capable of producing physical or psychological dependence, in an amount and frequency likely to result in overt intoxication or to lead to physical or psychological problems or anti-social behavior. Said in another way, when the continued use of a mood-altering substance means more to the individual than the problems associated with such use, that person can be described as abusing drugs. (Wilford. 1981, p.7)*

In this course, our concern is not primarily with what might be called “abuse”, but rather with the **continuum of use**. In young people, the significance of a minimal use pattern cannot be foretold — it may pass without trace, or turn into a destructive lifestyle. From this standpoint, we must be concerned about all adolescent drug use.

In order to understand drug effects, you will need to be familiar with two major processes influencing their intensity:

- the **concentration of the drug** at the site of action in the body, and the factors which determine it;

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*The definition of a drug is any substance used to change the mood, state of mind or state of being of the user.*

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*Smart and Jensen discuss the definition of “abuse” in your Book of Readings.*

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- the responses of the body to a given concentration of the drug, which change and develop over time — i.e., **tolerance**.

### 1.1 Concentration of the Drug at the Site of Action

The intensity of drug action depends largely on its concentration at the site of action. Concentration in turn depends on the dose administered; the way in which the substance is **absorbed, distributed, eliminated and metabolized** by the body; drug interactions; and some other factors. All are discussed below. The primary site of psychoactivity is the CNS, but actions at other sites (e.g., the heart) may have psychological effects (e.g., excitement).

#### Dose

Dose means amount consumed. In the case of legal substances, the dose of a drug either is known or can be estimated. For prescription or non-prescription medication it is normally written on the label. A dose of alcohol can be estimated by using the concept of the “standard” drink, illustrated below.



*This equation will play a part in the story of Theresa (videotape #4).*

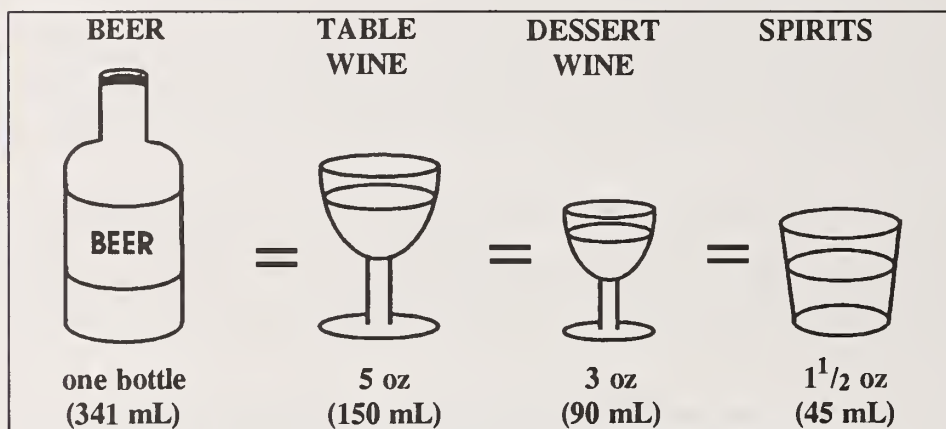


Fig. 2.1: “Standard” drinks consisting of a bottle of beer, a glass of table wine, a small glass of dessert (fortified) wine, or a “shot” of spirits. Each contains the same amount of alcohol.

In the case of illicit drugs, the dose is often unknown because of the great variability of these preparations. In the case of drugs derived from vegetable sources (e.g. marijuana), differences in strains of plants and cultivation techniques can greatly affect potency. In the case of synthetic drugs, potency varies according to:

- the chemical techniques of the manufacturer;
- the care with which these are carried out;
- age and storage conditions;
- purity.

#### Absorption

In order for a psychoactive drug to have an effect on the brain, it must be able to:

- cross the cell membranes of the small intestine, lungs, mucous membranes, etc. in order to be absorbed into the bloodstream; and

- cross the cell membranes of the small capillaries in the brain, in order to pass from the bloodstream to the site of action.

Most psychoactive drugs are able to cross cell membranes with relative ease, but the speed with which they enter the bloodstream and the brain depends on the **route or mode of administration**. The routes most commonly used are:

- ingestion (oral),
  - inhalation,
  - absorption across mucous membranes,
  - injection.
- **Ingestion:** Oral administration (swallowing a drug) is the most common and convenient method of drug administration. However, the rate of absorption of substances by this route tends to be rather slow since, for the most part, they must pass from the stomach into the small intestine before they can enter the bloodstream.

Absorption via ingestion may be slowed down by:

- the presence of food in the stomach;
  - stomach contents that dilute the drug;
  - stomach contents that are highly acidic or highly basic. (Some drugs are destroyed entirely by stomach acid or digestive enzymes, and must be given by injection if they are to be effective, e.g., insulin, some antibiotics, some hormones).
- **Inhalation:** Volatile substances (gases) and aerosols (suspensions of particles or liquid droplets in a gas) are usually administered by means of inhalation to the lungs. Absorption from the lungs occurs rapidly: the effects of a puff of smokable cocaine or tobacco smoke can be felt within seconds. Drugs that can be taken in this manner include solvents, propellant gases, and many general anaesthetics, as well as cannabis and tobacco, and some drugs given in the treatment of asthma.

The dose of an inhaled drug can be controlled by an experienced user. Absorption, and therefore the intensity of effects, can be modified by the user's adjusting the depth of inhalation, the duration of breath retention, etc. For this reason, the amount of drug in a smoke or vapour that is actually absorbed is difficult to quantify.

- **Absorption across mucous membranes:** Mucous membranes (the linings of the mouth, nose, eye sockets, throat, rectum, etc.) are more permeable than surface skin. Therefore, absorption through mucous membranes is both fast and effective for fat-soluble drugs. Drugs that are "snorted" into the nose include cocaine, and nicotine in the form of snuff; their effects may be felt within a minute or two. Cocaine and nicotine can also be absorbed through the lining of the cheek. Rectal administration can be used for many drugs as well.
- **Injection:** Injection bypasses normal biological barriers, drastically decreasing the time needed to get an effect. However, the risk of infection by contaminated needles or solutions is increased significantly. Drugs can be injected into many of the body's tissues or cavities. The most common routes of injection are listed below:
  - **Subcutaneous (S.C.) injection ("skin popping"):** This term refers to injection under the skin. It is used as a route of

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*It may take 30-60 minutes for the effects of an orally administered drug to be felt.*

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*The speed of the high is one of the attractions of inhalants, as in the case of Danny and his friends.*

administration for some therapeutic drugs, and by street users who are either inexperienced with needles or can no longer use badly scarred veins. Absorption is slower than when the same drugs are given intravenously (see below), but faster than when they are taken orally.

- **Intramuscular (I.M.) injection:** This involves the administration of a drug directly into muscle tissue. It permits a larger volume of solution to be injected than with S.C. administration, but there is usually more pain involved. I.M. injection is frequently used with therapeutic drugs but is not popular with street users.
- **Intravenous (I.V.) injection:** Intravenous injection (“mainlining”) delivers drugs directly into the bloodstream, and hence is the most rapid route of administration. It requires considerable skill, and therefore tends to be employed by the more experienced users.

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*Many of the hazards of taking drugs are inherent in the process of administration: no matter what is smoked, smoking is harmful; injecting is hazardous, no matter what is injected.*

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Injection produces a rapid rise in concentration of the drug in the blood if done quickly. Blood with a high drug level (or “bolus”) may reach the brain within a few seconds of administration. The resulting rapid rise in drug level in the brain accounts for the “rush” or brief period of intense drug effect that is experienced by the user.

Intravenous injection is extremely hazardous because of: (1) the risk of overdose, (2) the risk of infections (including HIV, the AIDS virus) from impure solutions or non-sterile injection techniques, (3) the risk that small particles or air bubbles (emboli) in the injected solution may block the normal flow of blood through the organs, which may be fatal.

### Distribution

Both the bloodstream and, to a lesser extent, the lymphatic system deliver drugs to their sites of action. The efficiency of distribution is uneven: some drugs bind easily to blood particles; some dissolve in body fat; a few may be deposited in bone tissue. Drugs must be highly fat-soluble in order to enter the brain.

Fat-soluble drugs can also cross through the placenta of pregnant women to affect the fetus, and can pass into the milk of lactating women.

### Elimination

As a drug is absorbed into the body, bloodstream concentration starts to fall. This drop reflects first, the movement of the drug from the bloodstream into the tissues (distribution), and later, its metabolism and excretion from the body (elimination). In general, the higher the drug concentration, the faster metabolism and excretion will proceed. Its exact rate of transformation is genetically determined for each individual.

The duration of effect of many drugs increases with the user's age. This may result from increased amounts of body fat (which acts as a reservoir for highly fat-soluble drugs), or from impaired liver or kidney function.

There are two major routes of excretion for most drugs:

- in the urine (via the kidneys);
- in the feces (via the liver), through the bile duct and the small and large intestines.

Certain drugs are also excreted through the lungs. The concentration of the substance in the exhaled air is always directly proportional to the concentration in the blood at that time. Since about 5% of a dose of beverage alcohol is exhaled, this principle can be used as a method to estimate blood alcohol levels. Various roadside screening devices ("breathalysers") are used for this purpose.

There are also several minor routes whereby small amounts of a drug may be excreted. These routes include:

- milk (of significance for the infants of nursing mothers);
- saliva (can be used for forensic analysis, e.g., the alcohol dip stick);
- other body fluids (sweat, tears, semen, etc.).

## Metabolism

Drugs are eliminated from the body in both changed and unchanged states. In order to facilitate excretion, the body transforms substances which are primarily fat-soluble into water-soluble by-products. This process is called **metabolism**, and it is a complex chemical transformation.

As a drug becomes progressively less fat-soluble, it loses its ability to enter the brain, and hence loses its psychoactivity. However, it is **not** the case that all metabolic action decreases the effectivity of all substances. Sometimes the metabolic by-products are more active than the original substance.

## Drug Interactions

A drug interaction occurs when one drug alters the action or effects of another drug present in the body at the same time. Some of the interactions may be trivial, while a few are dangerous, even life-threatening. Fortunately, most drugs do not interact with most other drugs.

- Drugs taken together may act independently of each other. For example, alcohol does not seem to interfere with the action of vitamins or oral contraceptives, or vice versa.
- Drugs taken together may enhance each other's effects. This may happen because of the similarity with which they act on the brain, or because one drug increases the level of the other in the body by interfering with its distribution, breakdown or excretion. For instance, alcohol and antihistamines are both CNS depressants, and are **additive** in their effects.

- Drugs taken together may have an antagonistic effect. This may occur when one drug “blocks” or prevents another drug from producing its effect. Antagonism may also occur when two drugs have opposite effects on the brain (e.g., alcohol-induced drowsiness versus caffeine-induced alertness), or if one drug alters the absorption or distribution of another.

Drug users may use different kinds of drugs in order to induce a spectrum of effects, or to control extreme effects. LSD and an amphetamine may be taken together to produce both hallucinogenic and stimulant effects at once. Tranquilizers may be used to counteract the effects of a cocaine “crash”.

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*Psychological factors are discussed again in relation to tolerance and dependence, pages 2-17 and 2-18.*

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Multiple drug use is common among adolescent users. It may be part of the spirit of experimentation, or a response to availability and price fluctuations. It can certainly add to the dangers of use, as you will see illustrated in videotape # 5, the story of “Chris”.

### Other Factors Influencing Drug Effects

The individual’s response to a drug or a combination of drugs is also affected by: body size, gender, nutrition, health status, habituation, state of mind, and social setting.

Psychological factors play a critical role: indeed, anticipation of a drug effect is often the most powerful predictor of its occurrence.

### SUMMARY:

It should be clear that when any drug is taken, many factors influence its effects and their duration: what the drug is, its dose, how it is taken, its absorption and elimination. For these reasons, you cannot expect to predict the effects of a drug of unknown quality and dose on a particular user.



*Before continuing with this Section, we would like you to do ACTIVITY 2.1 on page 2-21.*

## 1.2 Effects of Long Term Use: The Body's Adaptation to Drugs

When a person continues to use drugs over an extended period of time, other concepts and processes become relevant. We begin to talk about the user developing a “tolerance”, becoming “dependent” or “addicted”, and suffering “withdrawal” when drug use stops. These terms are part of our everyday vocabulary, but they are not clearly defined and used, even by the “experts”. This problem is compounded when you try to apply them to a young drug user, who will not have developed the body reactions of a long-time user.

### Tolerance

The magnitude of the body's response to a drug depends not only on concentration, but also on the **sensitivity** (responsiveness) of target cells and organs. Normally, chronic use leads to loss of sensitivity, or **tolerance**.

Tolerance is an adaptation of the body to repeated drug exposure, such that:

- drug effects of a particular dose become progressively less intense, and therefore:
- escalation of dose is required to achieve the initial effect.

Tolerance comes about in two ways, often happening in combination.

- **Metabolic tolerance:** The human body responds to repeated exposure to a drug by trying to get rid of it faster. This means an increase in the speed at which it is metabolized, or disposed of, by body systems — especially liver action. This adaptation shortens the duration of the “high”, and increases the dose required to maintain it.

Chronic use of one drug can sometimes increase the rate at which the liver is able to metabolize another substance via the same pathway, thus contributing to the occurrence of **cross-tolerance** — i.e., the reduction of sensitivity to one drug by prior administration of another.

- **Functional tolerance:** The CNS may adapt to chronic drug use by developing its ability to “resist” or counteract drug effects. For example, the CNS may learn to speed up in the presence of depressants, and slow down in response to stimulants. When this happens, the usual drug effect is diminished even if its concentration in the brain is kept constant. Users often respond by increasing their dose, if they can.

Normally, tolerance develops gradually over the course of days, weeks, or months of drug administration. But with some drugs it will occur after just a few routine administrations, as in the case of “learning” to smoke, which involves rapid tolerance to initial nausea and dizziness.

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*Tolerance is defined as the loss of sensitivity to a drug. It can be thought of simply as the body's way of protecting itself from the effects of drug use.*

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### Facts About Tolerance

- its onset varies from drug to drug;
- it does not develop equally to all effects of a drug (e.g. the lethal dose may remain constant while the dose necessary to get high may rise);
- the higher the dose taken, the faster tolerance develops;
- it develops faster if a drug is taken in a regular pattern than in a binge pattern;
- it develops faster if the user has a previous history of tolerance to that drug;
- it may develop faster in relation to effects like the loss of dexterity and alertness, which interfere with performance on the job, etc.

Drug processes also involve social and emotional dynamics. In the case of tolerance, for example, if a person administers a drug in the same room each day, s/he learns to expect the substance in that room, and his/her body learns to resist (or tolerate) the drug effects when in that environment. So tolerance is not just a physical process, but also has psychological components.

### Dependence

Drug dependence is normally described in terms of separate psychological and physical components, but this distinction is not clear and may not be useful in practice. It is more likely that “drug seeking behaviour” is inseparably both psychological and physiological in origin.

**Psychological dependence** is defined as the emotional or mental drive to continue taking a drug because the user feels that its effects are necessary to maintain a sense of well-being. In simple terms, the user “depends” on the drug in order to function or feel comfortable in some situation, e.g., at parties. In extreme cases, the user depends on the drug to feel okay under any circumstances.

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*Psychological dependence is a major factor in the continuation of drug use beyond experimentation.*

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The development of psychological dependence is a major factor contributing to the misuse of all psychoactive drugs. With certain drugs, such as tobacco and marijuana, which are associated with relatively mild physical withdrawal symptoms, psychological dependence may be the main determinant of their continued use.

**Physical dependence** is defined as the adjustment of bodily tissues in response to the continued presence of a drug, such that disturbing withdrawal symptoms develop when use of the drug is discontinued.

### Facts About Dependence

- physical dependence may not be apparent as long as the drug is being taken;
- the magnitude of physical dependence and the severity of withdrawal vary with the amount, frequency, and duration of drug use;
- drugs that are injected (e.g., heroin) or inhaled (e.g., nicotine) are more likely to produce dependence than those which are swallowed;
- the type of withdrawal symptoms manifested tend to be the opposite of the primary drug effect — that is, the symptoms reverse the acute effects of the drug. For example, withdrawal from depressants is characterized by hyperactivity of the CNS (irritability, seizures, etc.) while withdrawal from stimulants produces hypoactivity (slowing of CNS activity) and mood depression;
- tolerance and dependence are separate phenomena and may develop independently of each other.

The degree of physical dependence is indicated by the severity of withdrawal symptoms. For drugs such as alcohol, the barbiturates and the opioids, the withdrawal syndromes can be so unpleasant and threatening that they contribute enormously to the user's drive to keep on using.

The fact that some users do not develop dependence even with heavy use suggests the existence of a predisposing factor in certain people, or in their social circumstances, and challenges our assumption that the power to addict lies in the drugs alone.

**Cross-dependence** refers to the ability of one drug to suppress the manifestations of withdrawal from physical dependence on another drug, and therefore to substitute for the other in maintaining the physically dependent state (e.g. minor tranquilizers and alcohol). Cross-dependence explains the possibility of methadone maintenance programs for narcotic addicts. The synthetic opioid, methadone, can substitute for other drugs in the same family (heroin, morphine, etc.), but has the advantages of oral administration, longer lasting effect, and composition control.

### Addiction

The term “addiction” appears in different contexts with different implications, and very often carries unnecessary moral overtones. Most experts use it to describe **dependent patterns of drug use, including both physical and psychological dimensions**. It is best to think of “addiction” in terms of a continuum of escalating use, with increasing involvement and dependence, as well as increasing detriment to the user.



*Like Theresa in videotape #1, many people “need” a cup of coffee first thing in the morning, because they are experiencing caffeine withdrawal.*

### COUNSELLOR'S TIPS

- For the younger user, the psychological and social aspects of drug dependence may have the most relevance to treatment needs. Looking for dramatic signs of drug “addiction” in terms of physical dependence may lead to an **underestimation** of the problem; assessing **any** drug use as “addiction” may lead to an **overestimation** of the degree of difficulties being experienced.
- Addiction may be useful primarily as an umbrella term, bringing together a constellation of indicators of problematic drug involvement. Awareness of this range of drug using behaviours is particularly important when you are assessing the young drug user, who will not have the more striking physical symptoms of an older client with a long history of use.

### Withdrawal

Withdrawal is a term more colloquial than scientific in use. It refers to a set of physical symptoms and reactions, sometimes dramatic, which take place when an habituated drug user suddenly stops using. The body’s adaptive restructuring (functional tolerance) is unmasked, and the drug user will experience the full extent of oppositional responses his/her body has developed. Thus, stimulant drugs tend to produce “down” withdrawals, while depressant drugs produce “hyper” withdrawals.

There is considerable overlap in the withdrawal symptoms associated with drugs in the same group and even between drugs of different categories, so you cannot accurately infer what drug has been used from observing withdrawal. The possibility of confusion is compounded when the user has a multiple drug use pattern. A recent and accurate drug use history, including doses and times of administration, is essential for the implementation of appropriate therapeutic procedures.

The duration of withdrawal varies considerably from drug to drug depending on dose, the type of drug taken, the duration of use, and other pharmacological factors.

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*We will discuss withdrawal further in Unit 4.*

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Serious withdrawal can be a medical event, and may need to be treated where there are life support and drug testing facilities; however most drug withdrawal among adolescents is **not** life-threatening.



*Before continuing with this Section, we would like you to do **ACTIVITY 2.2** on page 2-22.*

**ACTIVITY 2.1**

1. The idea that standard amounts of beer, wine and spirits contain the same amount of alcohol, and therefore have equivalent effects, runs counter to everyday assumptions. Ask at least three people, including adolescents, to “guess” the relative alcohol content of the items pictured on page 2-12. Note their reactions when they learn the facts.

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2. As a review, list the six processes that determine drug concentration, and therefore intensity of drug effects.

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## ACTIVITY 2.2

The terms tolerance, dependence, addiction and withdrawal may very well come up in your conversations with young drug users. Develop your own definitions, in words and phrases you feel comfortable with, and rehearse explaining them to at least two adolescents. You might start by asking what they think each term means.

[illegible]

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## Section 2: DRUGS AND DRUG EFFECTS

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*In this Section, we will provide some information on drug identification, classification and abuse potential. The bulk of the Section is about individual drugs and their effects, matched to the booklet **Facts About Drugs**, which is part of your course package. Where possible, the information in this Section is youth specific. We will not discuss effects on society, as they are frequently the topic of other materials. Remember that you don't have to be an expert on individual drug effects to work well with young users.*

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### 2.1 Identification and Analysis

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The accurate identification of drugs is not easy. It cannot reliably be done by sight or by street name, and should not be attempted by the untrained. The young drug user will be your best source. S/he will be able to tell you what substances s/he is using, and will be more up-to-date than you are about street names, what's in and what's out, what new combinations are being tried, et cetera. However, since illicit street drugs are uncontrolled, neither you nor your client can be absolutely sure of:

- identity/composition
- potency
- purity.

If it becomes necessary to know the precise identity or composition of the substances being used (most often in relation to health effects and consequences), laboratory analysis provides the only certain results.

#### COUNSELLOR'S TIP

Don't be intimidated by adolescents' "street knowledge" of drugs. Treat them as a resource, and give them credit for what they know. But don't assume they know everything they pretend to: young drug users frequently boast, exaggerate or bluff.

## 2.2 Drug Classification

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There are many different ways of classifying drugs, based on dimensions such as source, function, and effect. The classification you will probably find most useful is a simple one, based on pharmacological effects in the central nervous system (CNS):

- CNS depressants (also classed as sedative/hypnotics):
  - alcohol
  - barbiturates (e.g. Amytal, Seconal, Nembutal)
  - inhalants/solvents
  - minor tranquillizers, i.e. benzodiazepines (e.g. Valium, Librium)
- hallucinogens:
  - cannabis (marijuana, hashish)
  - LSD, psilocybin, DMT
  - mescaline, MDA
  - PCP
- opioid (narcotic) analgesics:
  - heroin
  - morphine
  - codeine
  - methadone
  - opium
  - meperidine (e.g. Demerol)
  - and many others
- stimulants:
  - nicotine
  - caffeine
  - cocaine
  - amphetamines
  - and others
- mood modifiers:
  - major tranquillizers (used in treating psychiatric illnesses)
  - antidepressants

Within any of these principal groups, drugs may be further classified into subgroups, clarifying the particular type of drug dependence possible.

### COUNSELLOR'S TIP

It is not a good idea to refer to illicit substances by their street names. They are not precise; they are not reliable because they change frequently; and their use may convey an unintended tone of approval. Generic (pharmacological) terminology is a more reliable framework for substance identification.

## 2.3 Abuse Potential

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The abuse potential of a particular drug depends on three factors:

- its intrinsic capacity to produce dependence, especially by means of pleasurable effects;
- its perceived capacity to harm the user, either physically or psychologically, which is a deterrent to use;
- its image and availability.

Interaction among these factors will determine the extent of its use.

## 2.4 Individual Drugs and Their Effects

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A great deal is known about individual drugs and their effects — more than we can easily condense for this course. Nor can we predict exactly what pieces of drug information might become useful to you in the process of working with particular young people. In fact, often the most important thing to know for purposes of youth counselling and support is what effects the client is expecting: usually, whatever effects s/he is expecting, s/he will get.

It is also the case that young drug users may incur unique effects because of their stage in the life cycle. They have not yet reached maturity — physically, psychologically or socially — and the greatest negative effects of use may be to interrupt those developmental processes.

We recommend that you supplement this Section of Unit 2 by obtaining a handbook of drug information for reference purposes. Some good sources are listed on page 2-5, and annotated in the Bibliography at the end of the Unit.

We have also included in your materials package the booklet **Facts About Drugs**, published by the ARF and updated regularly. It provides a brief description of thirteen commonly misused drugs or groups of drugs, in terms of:

- general background,
- appearance,
- effects,
- relation to pregnancy,
- tolerance and dependence patterns,
- who uses and why,
- therapeutic uses,
- legal issues.

The information in **Facts About Drugs** is general; that is, it is not youth-specific. Most often, it does not need to be. In some cases we do not know enough to make it so. Furthermore, social and psychological factors will often modify or determine drug effects for a particular individual. In the following text, we will provide such youth-specific information as we have, plus a summary of standard drug effects for easy reference. The order of presentation follows the **Facts** booklet, and is alphabetical.

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*Some recent American studies suggest a relationship between drug use and immune system dysfunction.*

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*Very little research in pharmacology is youth specific.*

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## FACTS ABOUT ALCOHOL



### Read the section on . . .

. . . alcohol in the booklet **Facts about Drugs**, pages 1 to 4.

In your own notebook, list two or three new things you have learned that will help you in working with youth.

### Adolescents and alcohol



*The story of "Theresa" illustrates many of the issues of teenagers and alcohol.*

With the exception of caffeine, alcohol is the drug most widely consumed by young people. Use begins quite early. According to a 1986 Canada Health Survey of adolescents, the average age for first trying alcohol is 14. Many current studies suggest that by grade 7 or 8 (ages 13-14) approximately half of students have used alcohol in the past year. Among high school students, the figure rises to about 70%. Recent school surveys in Ontario tend to show that most adolescent drinking is episodic, and that the proportion of adolescents who drink appears to be levelling off or dropping slightly. However, the proportion of drinkers who consume five or more drinks on a single occasion has risen.

Among street youth, one recent survey reports 95% as current drinkers, with 6% drinking daily. In clinical populations (youth in drug treatment programs), alcohol consistently presents as a major problem, often as part of a multi-drug pattern of use.

Some of the short- and long-term effects of alcohol are presented in the chart below. Note that the long-term effects are seldom evident with young drinkers. It is the short-term effects that present the serious risks, especially of accidental injury or death while driving under the influence.

*Alcohol use still presents the most serious risks to the young today.*

Drinking among the young, whether of legal age or not, carries a high degree of social acceptance. But ironically, the detrimental effects of alcohol on the lives of adolescents far outweigh those of any other drug (with the possible exception of tobacco).

EFFECTS OF ALCOHOL:

| Short-term use <sup>1</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Long-term use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• initial relaxation</li><li>• loss of inhibitions</li><li>• impaired coordination</li><li>• slowing down of reflexes and mental processes (reactions)</li><li>• attitude changes, increased risk-taking to point of bad judgement/danger in driving a car or flying an airplane</li><li>• acute overdose may lead to death due to respiratory depression</li><li>• effects increased by sedative hypnotics, minor tranquilizers, opioids, and antihistamines</li></ul> | <ul style="list-style-type: none"><li>• regular heavy use increases the possibility of:<ul style="list-style-type: none"><li>• gastritis, pancreatitis</li><li>• cirrhosis</li><li>• certain gastrointestinal cancers</li><li>• heart disease</li><li>• brain/nerve damage</li><li>• suppression of sex hormone production, especially in males</li></ul></li><li>• <b>withdrawal:</b> the first (sometimes only) phase involves tremulousness, profuse perspiration, agitation, headache, nausea, rapid heartbeat</li><li>• convulsions and/or delirium tremens may occur upon withdrawal following regular heavy use</li></ul> |

<sup>1</sup> Please note that we use the terms “short-term” and “long-term” loosely. In fact, they have no accurate definition, as drug use occurs on a seamless continuum.

NOTE:

For **FACTS ABOUT AMPHETAMINES** see discussion under Cocaine and other stimulants.

## FACTS ABOUT BARBITURATES



### Read the section on . . .

. . . barbiturates and related sedative/hypnotics in the booklet **Facts About Drugs**, pages 9 to 11. Answer the following questions in your own notebook.

1. What is the most common medical use for barbiturates?
2. What is the danger of combining barbiturates with alcohol?
3. How are they used in combination with stimulants (amphetamines, cocaine, etc.)?

### Adolescents and barbiturates

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*For more information, see **Tranquillizers** in this Section, page 2-49.*

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The attraction of barbiturates is that at low doses they induce a state of relaxation and tranquillity; at higher doses, many users feel pleasantly “high”. The medical use of barbiturates (e.g. Amytal, Nembutal, Seconal, etc.) in the general population has declined greatly since the appearance of a safer group of sedative drugs called the benzodiazepines (e.g., Valium). However, they are far from having disappeared (accounting for 12-15% of new prescriptions in Ontario in 1982), and they are easily available to youth “on the street”, or via parents for whom they have been prescribed.

Surveys of adolescents indicate declining use since the mid-1970s, but given their highly addictive potential and dangerous side effects, the numbers are not reassuring. The 1989 high school survey by Smart and Adlaf showed a continuing downward trend, with 2.2% of the sample of Ontario students reporting one or more use of non-prescribed barbiturates. In the clinical population (youth in treatment), only about 1% report barbiturates as the major problem drug. Its use is most likely to show up as part of multiple drug use.

Stimulant users sometimes use sedatives to counteract the negative effects of repeated doses, to relieve associated sleep problems or to “come down” enough to function normally in social situations.

**EFFECTS OF BARBITURATES:**

| Short-term use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Long-term use                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• <b>low dose</b> relieves anxiety and tension, producing calmness and muscular relaxation</li><li>• <b>somewhat higher dose:</b> similar to alcohol intoxication, e.g. a high feeling, slurred speech<ul style="list-style-type: none"><li>— produces sleep in a quiet setting</li><li>— effects may make it dangerous to drive a car or perform other complex tasks</li></ul></li><li>• <b>much higher doses:</b> produce unconsciousness</li><li>• <b>acute overdose:</b> can be fatal due to suppression of breathing<ul style="list-style-type: none"><li>— increases the effects of alcohol, opioids, minor tranquillizers</li></ul></li></ul> | <ul style="list-style-type: none"><li>• tolerance and dependence develop rapidly if large doses used</li><li>• interferes with normal sleep — user may feel tired and irritable even though sleep has occurred</li><li>• <b>withdrawal:</b> tremulousness, anxiety, weakness, insomnia.</li><li>• <b>abrupt withdrawal:</b> progressive restlessness, anxiety and possibly delirium, convulsions, and death</li></ul> |

## FACTS ABOUT CAFFEINE



### Read the section on . . .

. . . caffeine in the booklet **Facts About Drugs**, pages 12 to 15. Answer the following questions in your own notebook.

1. List four commonly consumed substances containing caffeine, and the approximate amounts found in each.
2. What are the medical uses of caffeine?
3. How is caffeine use encouraged in our society?

### Adolescents and caffeine

Caffeine is the most widely and regularly consumed psychoactive substance in the world. Its easy availability makes its abuse potential high. It is the drug most commonly consumed by young people, who are particularly susceptible to caffeine's adverse effects because their bodies have not reached their developmental potential. Caffeine-containing beverages and foods, particularly cola soft drinks and chocolate, are not only very popular among youth, but also socially acceptable and sometimes encouraged for consumption.

When caffeine is consumed daily in quantities of 350 mg or more, a form of physical dependency may occur. Headache, irritability and fatigue are the primary withdrawal symptoms.

**EFFECTS OF CAFFEINE:**

| Short-term use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Long-term use (600 mg a day/8 cups coffee)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Psychological</b></p> <ul style="list-style-type: none"> <li>• Low dose (1-2 cups med. strength coffee)               <ul style="list-style-type: none"> <li>— mild mood elevation</li> <li>— heightened sensory awareness</li> <li>— increased alertness/postponement of fatigue and drowsiness</li> <li>— nervousness &amp; jittery feeling when taken by abstainers</li> <li>— disruption of sleep pattern when taken before bedtime</li> </ul> </li> <li>• Larger doses (more than 350 mg/4 cups coffee)               <ul style="list-style-type: none"> <li>— irritability, restlessness, nervousness, tremors</li> <li>— insomnia</li> <li>— occasionally a mild form of delirium</li> </ul> </li> </ul> <p><b>Biological</b></p> <ul style="list-style-type: none"> <li>• constriction of cerebral blood vessels causing headaches</li> <li>• increased peripheral blood flow, except in brain</li> <li>• stimulation of cardiac muscles, with larger doses rapid &amp; irregular heartbeat &amp; increased blood pressure</li> <li>• mild stimulation of respiration</li> <li>• gastric secretion</li> <li>• increased basal metabolic rate</li> <li>• increased body temperature</li> <li>• inhibition of glucose metabolism</li> <li>• increased free fatty-acid levels</li> <li>• relaxation of certain smooth muscles</li> <li>• increased urine flow</li> </ul> | <p><b>Psychological</b></p> <ul style="list-style-type: none"> <li>• chronic insomnia, disturbed sleep</li> <li>• anxiety</li> <li>• restlessness</li> <li>• depression</li> </ul> <p><b>Biological</b></p> <ul style="list-style-type: none"> <li>• gastrointestinal irritation</li> <li>• abnormally rapid &amp; irregular heartbeat</li> </ul> <p><b>Withdrawal:</b> physical dependence can be induced with the chronic consumption of 6 or more cups of coffee per day. Headache is the major withdrawal symptom, with the possibility of irritability, lethargy, and restlessness.</p> |

## FACTS ABOUT CANNABIS



### Read the section on . . .

. . . cannabis in the booklet **Facts About Drugs**, pages 16 to 19. Answer the following questions in your own notebook.

1. Which preparation of cannabis is the most potent: hashish, hash oil or marijuana?
2. Which effects of cannabis would be likely to interfere with school performance?
3. Imagine preparing for a debate on the proposition "Cannabis should be legalized". Choose one side of the argument and write a page or so of notes in defence of your position.

### Adolescents and cannabis

Surveys of use among high school students in the late 1960s and throughout the 1970s revealed increasingly widespread use. In 1979, American data showed about 50% of students surveyed to have used at least once, and at least 10% to be using daily. Canadian figures were consistently lower, but nonetheless indicated widespread use. In the 1980s, cannabis use first stabilized, and then began to show a decline. Use is still widespread, however, estimated roughly at about 15% for occasional use and 5% for daily use in Ontario. Cannabis is the fourth most popular psychoactive drug (after caffeine, alcohol and tobacco) for occasional use among adolescents, dropping off substantially among those over 25. This pattern makes sense in terms of our understanding of adolescence as a time of experimentation and rebellion.

Among clinical populations (adolescents seeking treatment for drug/alcohol use), cannabis and alcohol continue to be the major problem drugs. One third of adolescents in treatment in an urban Ontario centre in 1988 reported cannabis as their major problem drug, and 28% identified cannabis as a secondary or tertiary problem. A recent study of street youth in Toronto reported that 92% of the sample had used cannabis in the previous year, and 16% were using daily.

Many youth in treatment use cannabis as part of a multiple drug use pattern. Often they use large doses daily, but they may not consider their use of cannabis to be as problematic as their use of, for example, alcohol or cocaine.

The euphoria produced by cannabis use is less intense than that produced by cocaine or heroin, and does not appear to induce physical dependence in most users. If it does occur, it is very transitory, usually lasting about one week. A minority have great difficulty giving it up even when they try, because of great psychological dependence.

### **COUNSELLOR'S TIP**

The amotivational syndrome of loss of energy and general apathy is a common problem among heavy cannabis users in treatment, and can have detrimental consequences for the youth's healthy vocational and social development. This may give you a lever to begin working with the client toward changing his/her drug use, as we shall discuss in more detail in Unit 5.

**EFFECTS OF CANNABIS: (Duration of acute effects approximately 2-4 hours)**

| Short-term use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Long-term Use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Psychological</b></p> <ul style="list-style-type: none"> <li>• Low dose               <ul style="list-style-type: none"> <li>— drowsiness</li> <li>— feelings of well-being, euphoria</li> <li>— increased awareness</li> <li>— relaxation</li> <li>— driving skills and performance decrease</li> </ul> </li> <li>• Moderate dose               <ul style="list-style-type: none"> <li>— memory deficit</li> <li>— lapse of attention</li> <li>— decreased social inhibition</li> <li>— distorted time/space perception</li> <li>— mood changes (giddiness, laughing)</li> <li>— poor concentration</li> <li>— slowed reaction time</li> <li>— depressed/withdrawn behaviour</li> </ul> </li> <li>• High dose               <ul style="list-style-type: none"> <li>— depersonalization</li> <li>— hallucinations</li> <li>— fluctuation euphoria/dysphoria</li> <li>— panic reaction</li> </ul> </li> </ul> <p><b>Biological</b></p> <ul style="list-style-type: none"> <li>— red eyes, dilated pupils</li> <li>— respiratory tract irritation</li> <li>— cough</li> <li>— dry mouth</li> <li>— increase in pulse rate</li> <li>— hypertension (mild)</li> <li>— constipation</li> <li>— urine retention</li> </ul> | <p><b>Psychological</b></p> <ul style="list-style-type: none"> <li>• possible psychological dependence</li> <li>• loss of drive and interest in sustained activity (amotivational syndrome)</li> <li>• increasing risk or impairment of learning ability, memory</li> </ul> <p><b>Biological</b></p> <ul style="list-style-type: none"> <li>• moderate tolerance</li> <li>• increasing risk of:               <ul style="list-style-type: none"> <li>— chronic bronchitis, lung cancer</li> <li>— reduction of sex hormone levels</li> </ul> </li> <li>• possible decrease of immunity against infection</li> </ul> <p><b>Withdrawal:</b> abrupt termination of use may (infrequently) produce mild sickness, including sleep disturbance, nervousness, and upset stomach</p> |

## FACTS ABOUT COCAINE

### Read the section on . . .

. . . cocaine, amphetamines and other stimulants in the booklet **Facts about Drugs**, pages 20 to 23. Answer the following questions in your own notebook.

1. List five different ways of administering cocaine.
2. Describe the “attractive” aspects of a cocaine or amphetamine high.
3. Why do you think treatment of cocaine users is so difficult?



### Adolescents and cocaine

There has been considerable attention paid by the press and public to cocaine use in recent years, attention which has had the effect of exaggerating its significance. This notoriety plus the early association of cocaine with the glamour professions (entertainment and sports) may have enhanced its attractiveness to certain young people. So too has its availability in a smokable form, and its appearance on the market in the form of “crack” — an adulterated, and therefore less expensive, preparation.

When cocaine first became popular in the early '80s, users tended to be educated, middle class, 25 - 30 years old, and employed. By the mid-'80s, the profile changed to include many people who were younger, heavier users of other illicit drugs, less educated, unemployed, and poorer. Nevertheless, the overall prevalence of cocaine use appears to have levelled off at less than 1% among students and adults surveyed in Ontario in 1989. The reported use of crack by high school students declined between 1987 and 1989, although rates of use among street youth are harder to establish. In a 1990 study of 145 street youth in Toronto, 64% reported cocaine use in the previous year, 6% using daily.

At the same time, there are recent indications of increased **problem** use, with rises in the numbers of emergency room incidents, deaths and users seeking treatment. Thirty-eight per cent of 450 youth admitted to an Ontario treatment centre in 1988 reported that cocaine was their primary problem drug. This suggests the possibility that the number of heavy users has increased, although overall use has not.

“Free base” cocaine is prepared from the powder or crystalline form, by mixing it with an alkaline solution. Crack is a kind of free-base preparation, made by adding baking soda to a solution of cocaine hydrochloride and heating the mixture.

The dried residue is sold in the form of small lumps, which are smoked in a pipe. (In Canada, crack is sometimes called “rock”.)

A few very heavy users of cocaine may smoke, sniff or inject as much as 10 grams (10,000 mg) per day, although a more usual amount for social users is 20-30 mg. It is often chopped to a fine powder with a razor blade, arranged in “lines”, or strips, and snorted through a straw or equivalent. By injection, the peak effect is achieved within a minute or two; by inhalation, it may take up to 30 minutes.

The abuse potential of cocaine is extremely high, because

- the euphoria produced is very powerful;
- the euphoria can be achieved rapidly and delivered in an intense form — the “rush”;
- users may achieve effects equivalent to those of I.V. injection via inhalation, i.e. a more socially acceptable route of administration.

Health risks are high, as are the social costs of use.

The problem of cocaine use in Canada is a significant one, but it needs to be kept in perspective. The most recent surveys by the Addiction Research Foundation of Ontario suggest that among adults (18 years and over), 650,000 people have a problem with alcohol in comparison to 15,000 with cocaine, a ratio of more than 40 to 1. The ratio among adolescents is probably not much different. In addition, our views should not be overly influenced by the situation in the U.S. — the rate of crack use among Canadians is about 1/3 that of Americans at this time.

### Adolescents and amphetamines

Amphetamines are attractive because of their ability to increase temporarily feelings of alertness, wakefulness, energy and well being, and to reduce hunger. When they were more widely available, they were particularly attractive to students. Severe restriction of their medical availability, and intense police action to control their illicit production and sale has led to a substantial decrease in their use. However, the use of other stimulants, especially cocaine, appears to have risen to fill the gap.

The potential for dependence is considered high.

EFFECTS OF STIMULANTS:

| Short-term use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Long-term use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Low doses:<ul style="list-style-type: none"><li>— reduced appetite</li><li>— increased energy &amp; postponement of fatigue</li><li>— increased alertness</li><li>— faster breathing</li><li>— increased heart rate &amp; blood pressure</li><li>— increased risk of burst blood vessels or heart failure</li><li>— dilation of pupils</li><li>— cocaine also acts as a local anaesthetic</li></ul></li><li>• Higher doses:<ul style="list-style-type: none"><li>— talkativeness, restlessness, excitation</li><li>— sense of power, superiority</li><li>— illusions &amp; hallucinations</li><li>— some frequent users become irritable, aggressive, paranoid, panicky, or violent</li><li>— high blood pressure, dry mouth, fever, sweating, &amp; sleeplessness</li><li>— heart attack, stroke</li><li>— death</li></ul></li><li>• For cocaine also:<ul style="list-style-type: none"><li>— bizarre, erratic, sometimes violent behaviour</li><li>— paranoid psychosis (disappears if discontinued)</li><li>— sometimes sensation of something crawling under skin</li><li>— risk of convulsions</li><li>— death</li></ul></li></ul> | <ul style="list-style-type: none"><li>— malnutrition</li><li>— increased susceptibility to infections</li><li>— tolerance with high doses</li><li>— psychological and physical dependence, especially strong with cocaine</li><li>— after stopping, there usually follows a long sleep, depression, and ravenous appetite</li><li>— cocaine destroys nose tissue if sniffed</li><li>• Withdrawal: less pronounced with cocaine than with amphetamines, major symptoms include exhaustion, depression, and hunger upon waking</li></ul> |

## FACTS ABOUT HALLUCINOGENS

| DRUG NAME                                                         | APPEARANCE                                                                                                                                                | HOW IT'S USED                                                                                               |
|-------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| <b>LSD</b><br>(lysergic acid diethylamide, usually called "acid") | When pure, white, odourless, crystalline material<br>Street preparations usually mixed with coloured substances<br>In capsule form, tablet or liquid form | Taken orally<br>Sniffed or injected<br>Added to gelatin sheets or blotting paper<br>Liquid dropped into eye |
| <b>PCP</b><br>(phencyclidine, commonly called "angel dust")       | White, crystalline powder or capsules of various colours                                                                                                  | Smoked in a joint with marijuana or dried parsley<br>Injected or taken orally; snorted                      |
| <b>Mescaline</b><br><b>Peyote</b>                                 | Hard brown disks<br>Powder in capsules or tablet form                                                                                                     | Taken orally<br>Inhaled by smoking ground peyote "buttons"<br>Injected (rarely)                             |
| <b>Psilocybin</b><br>(commonly called "magic mushrooms")          | In pure form, white crystalline material<br>Dried brown mushrooms<br>Capsules containing powdered material                                                | Taken orally<br>Injected (rarely)                                                                           |



### Read the section on . . .

. . . hallucinogens in the booklet **Facts about Drugs**, pages 24 to 29.  
 Answer the following questions in your own notebook.

1. What are some naturally occurring substances, including foods, that may produce hallucinogenic effects?
2. What are the effects of LSD that might give rise to it being labelled "mind-expanding"?
3. Why is it uncommon to find a daily use pattern for hallucinogens?

Adolescents and hallucinogens

In the 1989 Addiction Research Foundation survey of drug use by Ontario high school students, 5.9% reported having used LSD and 4.3% said they had used other hallucinogens at least once during the preceding year. Rate of use was highest for older students, that is, those 16 and over. In general, hallucinogens appear to be less fashionable now than they were in the '60s, although a recent ARF survey of street youth indicated that LSD was the third most commonly used substance during the year prior (after alcohol and cannabis).

LSD is the most powerful of the hallucinogens. It can produce changes in perception, mood and thought in doses as low as .05 mg. Often these take forms which are particularly attractive to teenagers, e.g.:

- synaesthesia, the experience of senses uniting, such that a user believes s/he is “seeing” music or “hearing” colour;
- loss of boundaries between self and environment — the mystical or “cosmic” experience;
- distortions of time and space;
- sensory sharpness;
- aggrandizement of ideas.

In fact, the effects of LSD on any particular user, or even on the same user at different times, are difficult to predict. Adverse reactions (“bad trips”), although reported less frequently now than in the 1960s and 1970s, can be extreme:

- feelings of identity loss;
- loss of reality;
- fears of personal disintegration;
- acute paranoia.

These effects are more likely to be associated with self-harm than violence to others.

| EFFECTS OF LSD:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Short-term use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Long-term use                                                                                                                                                                                                                                                                                                                                                                                       |
| <ul style="list-style-type: none"><li>• initially, rapid pulse, dilated pupils, arousal, excitation, raised temperature</li><li>• later, distortions of perception, altered colours, shapes, sizes, distances, fusion of senses</li><li>• this may produce exhilaration, “mind expansion”, or (less often) anxiety and panic, depending on user</li><li>• feelings of panic or of unusual power or importance may lead to dangerous behaviour</li><li>• very occasionally, convulsions may occur</li><li>• tolerance develops very rapidly and disappears very rapidly</li></ul> | <ul style="list-style-type: none"><li>• no known physical dependence</li><li>• long-term medical effects are undocumented</li><li>• psychological effects may include “flashbacks” - spontaneous recurrences of LSD experiences without drug use</li><li>• psychological dependence</li></ul> <p><b>Withdrawal:</b> no sickness occurs when use stops, but extreme cravings may amount to panic</p> |

### EFFECTS OF OTHER HALLUCINOGENS:

| Short-term use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Long-term use                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• PCP               <ul style="list-style-type: none"> <li>— euphoria</li> <li>— increase in rate and shallowness of breathing</li> <li>— increase in blood pressure and pulse rate</li> <li>— flushing and profuse sweating</li> <li>— poor muscle control</li> <li>— generalized numbness of hands and feet</li> </ul> </li> <li>• With higher doses:               <ul style="list-style-type: none"> <li>— fall in blood pressure, pulse rate, and respiration</li> <li>— nausea, vomiting, blurred vision, rolling movements and watering of eyes, loss of balance, and dizziness</li> <li>— large amounts can cause convulsions, coma and sometimes death</li> <li>— effects of PCP can mimic certain symptoms of schizophrenia, hallucinations</li> <li>— delusions, mental confusion and “black-outs” are common</li> <li>— feeling of distance from one’s environment</li> </ul> </li> <li>• Mescaline and psilocybin               <ul style="list-style-type: none"> <li>— have effects similar to those of LSD; and, in fact, street samples are usually LSD or PCP, misrepresented as these drugs</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• PCP               <ul style="list-style-type: none"> <li>— possibility of flashbacks</li> <li>— possibility of prolonged anxiety or severe depression</li> </ul> </li> </ul> |

## FACTS ABOUT INHALANTS

### Read the section on . . .

. . . inhalants in the booklet **Facts about Drugs**, pages 30 to 33. Answer the following questions in your own notebook.

1. Name all the common or household products you can think of with the potential for use as an intoxicating inhalant.
2. List three ways in which inhalants may produce fatalities.
3. Find out if possession and use of inhalants is a legal offence in your jurisdiction.



### Adolescents and inhalants

Inhalants generally produce depressant effects similar to other sedatives; however, in small doses they will produce alcohol-like intoxication, or sensory distortions accompanied by delusions of grandeur. With so many different products in use, it is impossible to predict dose effects: a single container of cleaning fluid or paint thinner may be enough for a group of young users; a heavy user may require twelve tubes of airplane glue to become sufficiently high.

Many young users live in rural and isolated communities, where these substances are more readily available and less expensive than other drugs. There may be few alternatives to the drug-using subculture, and few incentives for them to quit using. Most outgrow solvent use, but some merely substitute other drugs.

Because of rapid absorption from the lungs to the bloodstream, and because of their low cost and easy availability, the abuse potential of inhalants is high.



*Based on these facts, do you think Danny had taken a large or small dose in videotape #2?*

**EFFECTS OF INHALANTS:****Short-term use**

- exhilaration and disorientation
- confusion, slurred speech, and dizziness
- distortions of perception
- visual and auditory hallucinations
- poor muscular control
- **With higher doses:**
  - drowsiness and unconsciousness
  - risks increase with fume concentration
  - plastic bag over face may cause death by suffocation in unconscious user
  - large doses of solvents may produce death from heart failure

**Long-term use**

- dependence may occur which includes craving and dangerous, excessive use
- upon withdrawal, the user may experience restlessness, anxiety, and irritability
- with some solvents it is possible that extensive exposure may lead to liver, kidney and/or brain damage
- **Withdrawal:** symptoms are not universally reported, but can include anxiety, hostility, depression, dizziness, and nausea

**NOTE:**

For FACTS ABOUT LSD see discussion under Hallucinogens.

FACTS ABOUT OPIOIDS

| DRUG NAME                                                                                               | APPEARANCE                                                                        | HOW IT'S USED                                                                                             |
|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Opium                                                                                                   | Dark brown chunks or powder                                                       | Eaten or smoked                                                                                           |
| Heroin<br>(Smack, Horse, Big H, Junk, Mud, Brown Sugar)                                                 | White or brownish powder                                                          | Injected after it is dissolved in water<br>"Snorted" into the nose<br>Smoked                              |
| Methadone                                                                                               | Solution                                                                          | Oral<br>Injected                                                                                          |
| Morphine                                                                                                | White crystals<br>Solutions or tablets                                            | Injected<br>Taken orally<br>Smoked                                                                        |
| Other Narcotics:<br>Demerol — (Demmies)<br>Percodan — (Percs)<br>Lomotil<br>Talwin<br>Dilaudid — (Dils) | Variety of forms:<br>capsules, tablets, syrups, elixirs, solutions, suppositories | Injected under skin (skin popping) or directly into vein or muscle<br>Snorted<br>Taken orally or rectally |

Read the section on . . .

. . . opioids in the booklet **Facts about Drugs**, pages 37 to 40. Answer the following questions in your own notebook.

1. Which opioids are successful painkillers, and do not produce dependence?
2. What illnesses are opioid users particularly prone to?
3. When heroin is scarce, what do you think most users would turn to as a substitute?



Adolescents and opioids

Not many young people use heroin or other narcotic analgesics, but first-time users are likely to be young. The progression from nasal inhalation to subcutaneous injection and then to intramuscular or intravenous injection reflects the desire for a quicker, more intense high, and is also a sign of increasing tolerance.

Supporting a heroin habit can be ruinously expensive, in part because increasing tolerance leads to the need for increasing dosage to achieve the desired effects.

It is popularly believed that even occasional use of heroin and other opioids will lead to dependence. However, some users can engage in “chipping”, or periodic use, such as on weekends.

| EFFECTS OF OPIOIDS:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Short-term use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Long-term use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"><li>• <b>Low dose</b><ul style="list-style-type: none"><li>— surge of pleasure or “rush”</li><li>— sense of gratification</li><li>— pain reduction</li><li>— dampening of sexual urges and hunger</li><li>— possible restlessness, nausea and vomiting (initially)</li></ul></li><li>• <b>Moderate dose</b><ul style="list-style-type: none"><li>— body feels warm, extremities heavy, mouth dry</li><li>— “on the nod” alternately wakeful/drowsy state</li></ul></li><li>• <b>High dose</b><ul style="list-style-type: none"><li>— breathing depressed, pupils contracted, skin cold, moist and bluish</li><li>— cannot rouse person</li><li>— death by respiratory failure</li></ul></li></ul> | <ul style="list-style-type: none"><li>• <b>Effects of IV injection and lifestyle:</b><ul style="list-style-type: none"><li>— may develop endocarditis (infection of heart lining and valves), hepatitis B</li><li>— abscesses, cellulitis, liver disease</li><li>— tetanus</li><li>— pulmonary complications, pneumonia</li><li>— AIDS and brain damage possible</li><li>— intractable constipation</li><li>— rapid development of tolerance and physical/psychological dependence</li><li>— loss of weight, reduction in sex hormone levels</li></ul></li><li>• <b>Withdrawal:</b> this class of drugs can produce severe symptoms, ranging from nausea and diarrhea, to spasms and cramps, and severe emotional disturbance, depending on the particular substance involved</li></ul> |

**NOTE:**

For FACTS ABOUT PCP see discussion under Hallucinogens.

## FACTS ABOUT ANABOLIC STEROIDS

### NOTE:

There is no corresponding entry in **Facts About Drugs**. Answer the following in your own notebook, after you have read this subsection.

1. What argument would you give to a youth contemplating the use of anabolic steroids to enhance athletic performance?
2. What is your opinion about the responsibility of coaches for their athletes' use of anabolic steroids?



### Adolescents and steroids

Anabolic steroids are synthetic preparations that mimic the male sex hormone testosterone. Examples include Testosterone Propionate (injected), Dianabol (taken orally), and Decudurabolin (injected). They are seldom prescribed for medical purposes: two exceptions are the treatment of certain types of cancer and hereditary angioedema.

Non-medical use of testosterone began approximately 30 years ago, when Russian and East European athletes were found to have used it to bolster their performance. Steroids are alluring in competitive sports because they are known to increase muscle bulk, which adds to the strength and powers of the athlete.

Doses consumed by weightlifters in preparation for competition may be as much as 20 to 30 times the normal therapeutic dose. Unlike drugs that have been in use for centuries, anabolic steroids appeared so little time ago that scientists know little about the effects of their use, short or long-term. However, this amount of testosterone is thought to be hazardous to health.

In response to the adverse effects of steroids, users often begin ingesting a series of other drugs which they hope will mask or counteract unwanted side effects. (This is referred to as "stacking".) The combined interaction of these drugs poses extremely serious health risks for developing youth. But many young people think that winning today is more important than purported future side effects. Moreover, they may be intentionally misinformed by drug dealers, in order to generate business.

When young people elect to experiment with illegal steroids, they are vulnerable to the purchase of impure, poor quality or fake products, which makes their drug-taking behaviour even riskier.

Officially, anabolic steroids are banned by the International Olympic Committee.

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*Concern about body image may also lead to steroid use.*

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*Refer to page 2-46 for side effects.*

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### EFFECTS OF ANABOLIC STEROIDS:

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• <b>Psychological</b> <ul style="list-style-type: none"> <li>— depression</li> <li>— nervous tension</li> <li>— irritability</li> <li>— aggressive behaviour</li> <li>— mood changes</li> <li>— listlessness</li> <li>— sleep disturbance</li> <li>— altered libido</li> </ul> </li> <li>• <b>Biological</b> <ul style="list-style-type: none"> <li>• <b>liver</b> <ul style="list-style-type: none"> <li>— abnormal liver function tests</li> <li>— liver tumours</li> <li>— jaundice</li> <li>— pelosis hepatitis</li> </ul> </li> <li>• <b>cardiovascular system</b> <ul style="list-style-type: none"> <li>— cholesterol modifications</li> <li>— heart disease</li> <li>— high blood pressure</li> <li>— edema</li> </ul> </li> <li>• <b>skeletal system</b> <ul style="list-style-type: none"> <li>— growing children may experience early close of the growth plates resulting in decrease in permanent height</li> </ul> </li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• <b>reproductive system</b> <ul style="list-style-type: none"> <li><b>Males:</b> <ul style="list-style-type: none"> <li>— testicular atrophy</li> <li>— decreased sperm production</li> <li>— prostate enlargement</li> <li>— sexual dysfunction</li> <li>— enlargement of breast</li> <li>— decreased blood level of testosterone</li> <li>— acne</li> </ul> </li> <li><b>Females:</b> <ul style="list-style-type: none"> <li>— facial hair growth</li> <li>— deepening of the voice</li> <li>— male pattern baldness</li> <li>— decreased breast size</li> <li>— enlargement of the clitoris</li> <li>— menstrual irregularities</li> <li>— acne</li> </ul> </li> <li><b>Children &amp; Adolescents:</b> <ul style="list-style-type: none"> <li>— may experience acceleration of secondary sexual characteristics</li> </ul> </li> </ul> </li> </ul> |
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### COUNSELLOR'S TIP

**For further information, contact:**

*Sport Medicine Council of Canada*

*1600 James Naismith Drive*

*Ottawa, Ontario*

*K1B 5N4*

*(613) 748-5671 (24 hr. answering service)*

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## FACTS ABOUT TOBACCO

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### Read the section on . . .

. . . tobacco in the booklet **Facts about Drugs**, pages 44 to 47. Answer the following questions in your own notebook.

1. About what percentage of health care costs are accounted for by tobacco-related illness?
2. List five ways in which smokers can increase the amount of nicotine they consume from a single cigarette.
3. Dependence is commonly observed if a smoker exceeds how many cigarettes per day?



### Adolescents and tobacco

Caffeine, alcohol, and tobacco continue to be the most popular drugs in the high school student population. In 1987, one in four students reported having used tobacco at least once in the previous year. There is no longer any significant difference in the prevalence of smoking tobacco for male or female students, and rates tend to increase for older students, age 16 and over.

The prevalence of tobacco use by high school students has dropped in recent years. Social disapproval of smoking and legal restrictions on usage may have an impact on future patterns.

Teenagers are more likely to smoke if their parents, family, and friends do. Many more dropouts than those still in school are smokers.

It is generally agreed that dependence develops among chronic smokers of several (e.g. 10) cigarettes a day.

| EFFECTS OF TOBACCO (when smoked):                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Short-term use                                                                                                                                                                                                                                                                                                                                                                                                                                | Long-term use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <ul style="list-style-type: none"><li>• increased pulse rate</li><li>• rise in blood pressure</li><li>• drop in skin temperature</li><li>• relaxed feeling in regular smokers</li><li>• increased acid in stomach</li><li>• reduced urine formation</li><li>• stimulates, then reduces brain and nervous system activity</li><li>• loss of appetite, physical endurance</li><li>• improved performance on cognitive and motor tasks</li></ul> | <ul style="list-style-type: none"><li>• narrowing or hardening of blood vessels in heart, brain, etc.</li><li>• shortness of breath, cough</li><li>• more respiratory infections</li><li>• chronic bronchitis</li><li>• emphysema</li><li>• risk of cancer of lungs, mouth, larynx, esophagus, bladder, kidney, pancreas</li><li>• stomach ulcers</li><li>• risk of thrombosis in users of birth control pills</li><li>• tolerance develops rapidly</li><li>• development of dependence, physical and psychological</li></ul> <p><b>Withdrawal:</b> symptoms vary widely, but include depression, anxiety, sleep disturbance, constipation and lowered blood pressure.</p> |

FACTS ABOUT **TRANQUILLIZERS**

| DRUG NAME                                                                                                                                                                                                                         | APPEARANCE              | HOW IT'S USED |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------|
| <b>Benzodiazepines</b><br>e.g., chlordiazepoxide, diazepam, meprobamate, flurazepam, lorazepam<br><br><b>BRAND NAMES:</b><br>Librium, Valium, Equanil, Dalmane, Ativan<br><br><b>STREET NAMES:</b> pumpkin seeds, tranks, downers | Tablets<br><br>Capsules | Taken orally  |

**Read the section on . . .**

. . . tranquillizers in the booklet **Facts about Drugs**, pages 48 to 51.  
Answer the following questions in your own notebook.

1. Are the so-called “major” tranquillizers (the neuroleptics) more or less likely to produce addiction problems than the “minor” ones?
2. List four therapeutic uses for benzodiazepines.
3. What are the two common patterns of benzodiazepine involvement?



**Adolescents and tranquillizers**

Surveys of prescriptions indicate that the medical use of benzodiazepines is common. For example, in Ontario in 1982, anti-anxiety agents accounted for 45% of all new psychotropic drug prescriptions. Of these, 86% were for benzodiazepines. An additional 13% of new psychotropic drug prescriptions was accounted for by the benzodiazepine sleeping medications.

Use is higher among women than men, with about twice as many women in every age group prescribed these drugs. Nevertheless, men and women are equally represented among abusers. There is also a pattern of increased use with age. All too often prescriptions are refilled without an office visit by the patient.

In the 1989 Addiction Research Foundation survey of drug use by Ontario high school students, about 3 % reported use of prescribed tranquillizers and 3.4% of non-prescribed tranquillizers at least once during the preceding year. Although this figure is down from the preceding years, it is too small to be a reliable basis for generalization.

In a recent study of street youth in Toronto, 59% of the sample reported use in the past year, with a greater use rate among girls than boys. In fact, diazepam was the fifth most commonly used drug by respondents in this study.

Alcohol-dependent people and users of other drugs are at high risk for tranquilizer misuse. For example, methadone maintenance and alcohol treatment programs report that their clients frequently misuse tranquillizers. In addition, amphetamine and cocaine users often take them to reduce “crash” symptoms — the unpleasant side effects (anxiety, paranoia, etc.) of high dose use of these drugs. The practice of prescribing tranquillizers to those undergoing withdrawal and/or treatment carries some risk of transferring their dependence to tranquillizers, and should be carefully monitored.

EFFECTS OF TRANQUILLIZERS:

| Short-term use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Long-term use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• <b>Duration of effects</b><ul style="list-style-type: none"><li>— calms hyperactivity, tension and agitation</li><li>— diminished emotional responses to external stimuli, e.g., pain</li><li>— muscle relaxation</li><li>— reduced alertness</li><li>— short-term relief of anxiety</li><li>— combats severe withdrawal effects of other depressant drugs</li><li>— increases effects of alcohol, sedatives and opioids</li></ul></li><li>• <b>With higher doses:</b><ul style="list-style-type: none"><li>— possible impairment of muscle coordination, dizziness, low blood pressure, and/or fainting</li></ul></li></ul> | <ul style="list-style-type: none"><li>• physical dependence</li><li>• <b>withdrawal ranges in intensity from:</b><ul style="list-style-type: none"><li>— progressive anxiety</li><li>— restlessness</li><li>— irritability</li><li>— insomnia</li><li>— gastrointestinal disturbances</li><li>— loss of appetite</li><li>— changes in perception</li><li>— sweating, trembling, weakness</li></ul></li><li><b>to:</b><ul style="list-style-type: none"><li>— delirium</li><li>— convulsions</li></ul></li></ul> |

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### Section 3: PREVALENCE OF DRUG USE, AND DRUG USE PATTERNS

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*In this Section, we are going to discuss trends in drug use in the adolescent population, in question and answer format. Data tend to be more readily available for school-attending youth than for street users, which somewhat limits the picture. Risk factors associated with adolescent drug use are looked at again, from a different angle.*

Perhaps one of the most confusing issues for those concerned about drug use is whether it is increasing, especially among young people. Are we in the midst of an “epidemic,” as some politicians and law enforcement authorities claim? Are more kids using drugs now than did “before”? Are they starting at a younger age, or are they using more dangerous drugs than they did previously?

Although definite opinions are held on these issues and their implications, the “facts” are not clear-cut. Estimates of drug prevalence are usually based on indirect measures, e.g. the quantity of drugs seized by police, or responses to surveys. However, despite their limitations, we can look at these estimates to get some notion of changing patterns of adolescent drug use over the past twelve years. In this section, we will attempt to answer some of the critical questions about adolescent drug use by drawing on a number of survey studies conducted with high school students and on assessment data collected from young people in treatment for drug abuse. A primary source is the series of surveys of Ontario high school students conducted biennially by the Addiction Research Foundation (Smart and Adlaf, 1989 and previous).

#### 1. Is drug use increasing among high school students?

In general, the answer to this question, at least in Ontario for the period from 1977 to 1989, appears to be “no” — that is, the answer is “no” if we are concerned with prevalence, or the percentage of students using a drug at least once. Smart and Adlaf (1989), reporting on a series of surveys conducted at two year intervals from 1977 to 1989, found that the overall percentage of Ontario high school students reporting drug use was not increasing. In fact, the reported use of several drugs declined in those years, including cannabis, stimulants, tranquilizers and non-medically prescribed barbiturates. Smart and Jensen report some regional and national figures in your Book of Readings, Tables 2.1 and 2.2.

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*The overall trend in the 12 year Ontario student surveys is toward moderate declines in the use of most drugs.*

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It would appear from these data that the percentage of users in the school age population peaked in the period between 1977 and 1979, and has remained steady or has declined in recent years (see Table 2.1 on the following page).

Smart and Adlaf (1989) reported that Ontario students did not find cannabis as easy to obtain in 1989 as they did in 1985. This suggests that availability may also be a factor in accounting for levels of drug use; and availability is, of course, open to change and fluctuation.

| DRUG                | Percentage Using Drug at Least Once During the Prior Year |                    |                    |                    |
|---------------------|-----------------------------------------------------------|--------------------|--------------------|--------------------|
|                     | 1977<br>(N = 4687)                                        | 1981<br>(N = 3270) | 1985<br>(N = 4154) | 1989<br>(N = 3915) |
| Tobacco             | 30.4                                                      | 30.3               | 24.5               | 23.3               |
| Alcohol             | 76.3                                                      | 75.3               | 69.8               | 66.2               |
| Cannabis            | 25.1                                                      | 29.9               | 21.2               | 14.1               |
| Glue                | 3.9                                                       | 2.3                | 2.0                | 1.9                |
| Other Solvents      | 6.6                                                       | 3.2                | 2.7                | 3.1                |
| Barbiturates (M)    | 14.2                                                      | 12.5               | 9.0                | 7.8                |
| Barbiturates (NM)   | 6.0                                                       | 8.1                | 4.4                | 2.2                |
| Heroin              | 2.0                                                       | 1.5                | 1.5                | 1.2                |
| Speed               | 2.7                                                       | 3.0                | 3.1                | 2.5                |
| Stimulants (M)      | 6.6                                                       | 6.1                | 4.3                | 3.3                |
| Stimulants (NM)     | 7.2                                                       | 12.1               | 11.8               | 6.5                |
| Tranquillizers (M)  | 8.6                                                       | 7.5                | 4.7                | 3.1                |
| Tranquillizers (NM) | 4.9                                                       | 4.9                | 3.3                | 2.4                |
| LSD                 | 6.1                                                       | 10.2               | 7.4                | 5.9                |
| Other Hallucinogens | 4.3                                                       | 4.7                | 4.8                | 4.3                |
| Cocaine             | 3.8                                                       | 4.8                | 4.5                | 2.7                |
| PCP                 | —                                                         | 2.5                | 1.7                | 1.1                |

Table 2.1: Alcohol and Other Drug Use Among Students in Grades 7 to 13. Adapted from R. Smart & E. Adlaf (1989). The Ontario Student Drug Use Survey: Trends Between 1977-1989. Toronto, ON: Addiction Research Foundation.

(M) = Medical Use; (NM) = Non-Medical Use; — = Not Queried;

2. What factors contribute to the changing rate and nature of teen drug use?

Availability, as well as cultural, economic, and societal factors, influences the way drug use patterns develop.

- **Cultural and societal influences:** For adolescents in Canada today, experimentation with drugs (especially tobacco and alcohol) is common, not the exception, but this was not always the case.

After the second World War, there was a significant increase in the use of alcohol by young people. The use of other substances remained rare, and was largely confined to specific cultures such as musicians and artists. The protest movements of the sixties are associated with an increase in the use of cannabis. Experimentation with marijuana and hashish, and the changes in consciousness they produced, were a much touted part of the so-called “counter-culture”. Other substances, such as hallucinogens, amphetamines, cocaine and opioids, including heroin, became more widely available and used at that time too. For the first time in modern history, young people were exposed to a public debate about drug use that included passionate defence of such use as an appropriate, even life-enhancing social behaviour.

How the cultural climate and events of those years related to increased drug use is a complex question with no simple answers. Whatever the reasons for increased use, there was sufficient concern in the 1960’s that many treatment and research centres added “other substances” to mandates which had previously focussed solely on alcohol use.

*If you were involved in this debate in the 1960’s, how and why have your views changed since?*

Today, experimentation with certain drugs is acceptable among teenagers, and the list of what is acceptable to some youth has grown to include more than tobacco and alcohol. It is not hard to see this as part of a **general** social pattern to look for the “chemical fix” when anything goes wrong, and/or a recipe for constant fun and excitement. At the same time, some drug use appears to be declining, which may be the reflection of a health-oriented society increasingly aware of issues of “wellness” and physical fitness. If you feel confused, you’re not alone, for the place of drug use in this social picture is not self-evident. Cultural factors, such as the increasing gap between rich and poor, may also modify the patterns.

- **Social environment, costs, and availability:** The social context of adolescents includes not only the larger culture of which they are part, but also their communities, their schools and their families. Some studies have shown that substance abuse (use) may be clustered within certain neighbourhoods in a community. In addition, many communities have places where young people congregate to drink and use other drugs. These places may be as obvious as parks and arcades, or they may be settings less commonly frequented — except by those “in the know” (e.g., “crack houses” or the “drinking bridge”). In large urban settings, the “street scene” is a major context for drug use.

Availability is also an important consideration in understanding drug use patterns and prevalence. In large cities, young people have potential access to virtually any drug they want to use, and can often acquire drugs on short notice. Once a youth has started buying directly from suppliers, s/he may face added pressure to try other substances from the “product list”. The changing cost of certain drugs may also affect usage, especially for adolescents who don’t have ready cash. In rural areas where accessibility is limited, or in populations where money is scarce, young experimenters may turn to easily acquired solvents and glues. The apparent impact of “crack” on the market for cocaine products also highlights the effect that lower prices can have on prevalence of use.



*What are the effects of social environment, cost and availability on Danny’s drug use behaviour?*

### 3. Are there any new trends in youth substance use?

One new area of concern is the observation that the age of first use may be declining. This is disturbing, if true, because the harmful effects of substance use have more serious implications for young people at earlier stages of their development, both physically and psychologically. New and often riskier types of drugs and higher dosage preparations of familiar drugs compound the risk to younger users.

Another area of concern is that, although the number of users may be declining, the degree of problematic use among those who continue to use some drugs seems to be rising. The frequency of use among regular users is increasing for some substances, as is the tendency to drink five drinks or more at a sitting, especially among adolescents.

Finally, the trend to declining use seems to be coming to an end in the United States, although there have been notable differences between Canadian patterns of use and those in the U.S.A, and Canadian rates of use have always been lower.

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*Alcohol, tobacco and cannabis are the drugs of choice for most young users.*

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#### 4. What drugs are youth most likely to be using?

Although patterns fluctuate and drugs have their cycles of popularity, **three drugs continue to dominate** in surveys of high school students. The surveys of Smart and Adlaf clearly demonstrate that the drugs most likely to have been used at least once in the prior year are **alcohol, tobacco, and cannabis**. In 1989, about 66% of students reported using alcohol, 23% used tobacco, and 14% used cannabis. Although the use of cannabis has declined, the use of tobacco and alcohol has not. So, although the consumption of more “exotic” drugs may capture our attention (and with good reason), we should not ignore the very significant use of more “traditional” substances. (For more on the effects of alcohol, tobacco, and cannabis, see Section 2 of this Unit.)

Even among clinical populations, cannabis and alcohol are named as the problem drugs by most adolescent users, along with cocaine and amphetamines. Among street youth in a recent ARF study, the most commonly used substances were alcohol, cannabis, LSD, cocaine, and diazepam, in that order.

#### 5. What drugs are the next most commonly used?

In 1989, the medical use of barbiturates, the non-medical use of stimulants, and the use of LSD were next most likely to be reported by Ontario high school students (at about 8%, 6.5%, and 6%, respectively). Only a small minority reported use of any other drugs (see Table 2.1, page 2-52). Nevertheless, there are serious risks associated with even infrequent use of those drugs with the potential for drug dependence and associated problems, especially those associated with I.V. use. For more information on the use patterns of particular drugs, and for summaries of common effects, see individual drug descriptions in Section 2 of this Unit.

#### 6. What about other drugs? Don't kids progress from alcohol and cannabis to other substances?



*Do you recall the impact of the “gateway” assumption on teachers Daphne and Percy in the “Cindy” story?*

Some researchers have argued that alcohol, cannabis, and tobacco operate as “gateway” drugs, that is, that they lead to harder drug use, implying a causal sequence. It is true that young people who use serious drugs will report, almost without exception, that they began by experimenting with the gateway drugs. But this is not to say that any adolescent who experiments with these so-called “soft” drugs will go on to increased drug use: critics of the gateway theory point out that users all started out drinking milk too.

#### 7. What about age and sex differences? Is it true that more girls are using drugs now?

In the fifties and early sixties, males were more likely than females to smoke, drink, and use other substances. However, this trend began to shift in the late sixties, and sex differences in drug use have decreased significantly over the years. In the 1989 Ontario student survey, the prevalence of the reported use of glue, PCP and cocaine was less among females, but there were no significant

differences in the reported use of tobacco, alcohol, solvents other than glue, heroin, or cannabis.

A somewhat different picture emerges when we consider the frequency of use, that is, how often an adolescent is using a substance, rather than how many adolescents have used it at least once. Frequency of use tends to be greater in the male population, with boys more likely to report heavier use of alcohol, cannabis, and tobacco.

Studies also suggest that girls are more likely to believe that they will develop health problems as a consequence of cannabis use and this may, in part, account for the recent declines in their reported use.

### 8. Are there any signals that might help to identify those young people most at risk for abuse?

Only a few of the young people who experiment with drugs during adolescence go on to develop lifestyles that revolve around use and related activities, and continue into adulthood. For some, the associated lifestyle becomes as reinforcing as the effects of the substances themselves. Others learn to use particular substances to compensate for perceived weaknesses such as shyness, or to overcome stress and block out unpleasant feelings. From the youth's perspective, substances produce happiness, laughter and pleasant changes in sensation. The entertainment value of the experience is strong, as are the social reinforcers immediately following use. (In general, drug use always has at least some positive consequences, or it would stop.) Unit 1 on adolescent development demonstrates how vulnerable the average young person is to such experiences. But how can we tell which young people will develop problematic patterns of use, and which will conform to more acceptable norms within their peer group?

No single cause has been identified to explain the phenomenon of youth substance use. However, the probability of experimental or recreational use becoming problem use increases with the number of influencing factors faced by the individual youth. A risk factor approach may be desirable in understanding abuse. Common influencing factors include the following:

- **Early initiation of use:** The younger an individual is when s/he starts to use substances, the more likely s/he is to abuse them.
- **Family history of substance use:** The risk of abuse increases when one or more family members (parent, sibling) abuse drugs or alcohol.
- **Parental attitudes:** In families where the youth perceives that parents approve of alcohol or drug use, the youth is more likely to use and perhaps develop associated problems.
- **Other family factors:** In families with a history of physical/sexual abuse, instability, separation, rejection of the youth, dominance or excessive freedom, the young person is at greater risk for substance use.
- **Low economic status:** It is sometimes claimed that young people of low socio-economic status may be more likely than their middle class counterparts to use substances, because of a lack of alternatives in present lives and future possibilities, but data are not conclusive. Very high economic status may be a factor too, permitting drug expenditures.

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*See Unit 1 for more on risk factors in adolescence, and Unit 3 for more on identification.*

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*You will see this factor operating in the story of "Chris", videotape #5.*

- **Peer influence:** As the youth's pattern of use continues, s/he may socialize more and more with others who use substances, in a reinforcing cycle.
- **History of maladaptive behaviour:** Youth who were experiencing behaviour problems prior to the onset of substance use may be more at risk of developing patterns which become abusive. Substance abuse is sometimes explained as being a result of unresolved behaviour problems.
- **Cultural aberration:** The more a youth's pattern of use exceeds the norms for his social and cultural milieu, the more likely s/he is to develop a pattern of abuse.
- **Antisocial behaviour:** Youth who have difficulty interacting with or little feeling for other people are more likely to develop problems related to the use of substances.
- **Reliance on substances to improve performance:** Youth who experiment with substances to compensate for deficits, or otherwise enhance performance, are at risk for abuse because of the possibilities of side effects and of psychological dependence. Some use drugs to compensate for such things as attention deficits, while others believe that they cannot perform activities such as sex without first using a substance. Still others in organized sports use substances to enhance performance.
- **Unemployment:** Youth who do not attend school or work are at higher risk for substance use. Similarly, absenteeism may be a sign of developing misuse. Youth who lack vocational aspirations are at more risk than those with clear career goals.
- **Involvement in substance related activities:** There is a circular relationship between certain adolescent lifestyles and substance use, e.g., street life, criminal activities, etc.
- **General dissatisfaction:** Youth with chronic low self-esteem or unresolved anger are at high risk for substance abuse. Rejection, mistreatment, frequent moves and poor grades are some of the factors which can lead to general dissatisfaction, as can chronic health problems and family conflict.

Not all youth who use substances are exposed to the risk factors described above, and those who are will respond in different ways depending upon past experience and their psychosocial background, especially strengths such as family support. "Risk potential" means the cumulative exposure to risk factors over time. Methods of assessing the potential for substance use will be explored further in the Units on Identification and Assessment in this course.

## 9. What about the adolescents who end up in treatment? Is their drug use different from that of other young people?

Youth who end up in treatment for problematic drug use are themselves a variegated population, on a continuum from early use to severe dependence. Those who use drugs with the highest addiction potential (e.g. cocaine) may develop more dramatic problems sooner, and seek help earlier (if at all). In the Youth Clinic at ARF, clients report cocaine, cannabis, and alcohol (in that order) as their major problem substances.

Young people who misuse drugs rarely use only one. This may be because, for at least some young people, the substance itself is not the problem, but rather they are acting out a behaviour pattern which does not distinguish among drugs. Multiple drug use occurs also because of the general attractiveness of experimentation for this age group. Studies conducted at the Addiction Research Foundation of Ontario by Wilkinson and Martin (1983) confirmed that the drug dependent person who is a heavy user of only one substance is a rarity: 90% of the young people studied during treatment had used substances from four or more drug classes in the year preceding treatment. American studies of young drug users have demonstrated that of the individuals admitted to treatment, 40% were regularly using three or more drugs.

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*Multiple drug use is further discussed in Chapter 2 of your Book of Readings.*

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#### SUMMARY:

Drug use is a complex phenomenon, and comprehensive data on use patterns do not exist. The best data describe student use, which shows a declining trend over time, at least in Ontario. However, the frequency of problem use does not appear to be declining, even in that population. Alcohol and tobacco dominate the use list, followed by cannabis. The preference order among street users is less well established.

*Before concluding your study of this Unit, we would like you to do ACTIVITY 2.3 on page 2-58.*



*When you have completed this Unit, please return to page 2-6 and tick off the learning outcomes you have achieved.*



### ACTIVITY 2.3

Go to your local library, and look up four or five recent articles in the popular press about youth and drugs. How do their accounts and implications vary from ours in terms of patterns of use imputed to youth?

[illegible]

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## 4. GLOSSARY OF DRUG TERMS

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**Abstinence**

Stopping use of a given drug following a period of protracted use, or non-use in any form.

**Abuse potential**

The tendency of a drug to promote widespread abuse, which depends on the interaction among three factors:

- its propensity to produce dependence in the user;
- the ease of its availability, and the social norms governing its use;
- its inherent harmfulness to the mind and/or body of the user.

**Acute**

Rapid; sudden; short-term; severe.

**Addiction, drug**

A state of dependence upon a psychoactive substance which is harmful to physical and/or mental health, social well-being, and/or economic functioning.

**Analgesic**

A drug which can lessen pain without causing unconsciousness. Examples: Acetylsalicylic acid (ASA), the opioid family.

**Antagonist**

Pharmacologically, a drug which blocks or creates resistance to the effects of another drug.

**Autonomic nervous system**

That part of the nervous system which is not under voluntary or conscious control, e.g., that which controls blood circulation, digestion, etc.

**Central nervous system (CNS)**

That part of the nervous system comprising the brain and the spinal cord.

**Chronic**

Of long duration.

**Cirrhosis**

The replacement of normal liver tissue with dysfunctional fibrous tissue; a progressive disease frequently associated with chronic alcoholism.

**Cross-dependence**

The ability of one drug to suppress the effects of withdrawal from another drug with similar pharmacological effects.

**Cross-tolerance**

A condition of reduced sensitivity to the effects of one drug due to acquired tolerance to another drug.

**Delirium tremens (DTs)**

A protracted phase of alcoholic withdrawal characterized by frightening hallucinations, delusional thinking, extreme mental confusion, disorientation, severe agitation, and abnormally high body temperature.

**Dependence, drug**

A state of dependence upon a drug substance which is harmful to physical and/or mental health, social well-being, and/or economic functioning.

**Dependence liability**

The relative propensity of a drug to create dependence in the user.

**Depressant**

A drug which causes the functions of an organ system to slow down; e.g., barbiturates and alcohol act as depressants on the central nervous system.

**Disinhibition**

Reduction or loss of inhibition; e.g., emotional disinhibition results in greater freedom of emotional expression.

**Drug**

Any substance which is used to produce desired physiological or psychological effects.

**Dysphoria**

An unpleasant emotional state, such as anxiety or depression.

**Euphoria**

An exaggerated feeling of well-being.

**Hypnotic**

A drug which induces sleep, e.g. barbiturates, flurazepam.

**Inhibitor**

A drug substance which blocks physiological actions; e.g. antihistamines.

**Metabolism**

Pharmacologically, a process whereby drug substances are converted in the body into different substances (metabolites).

**Narcotic**

Literally, that which numbs or deadens. The term is used scientifically to encompass all opioid analgesics (i.e., opiates and opioids). However, "narcotic" has a different meaning in the criminal statutes of some countries. In Canada, the Narcotic Control Act includes such drugs as cannabis and cocaine.

**Neurotransmission**

The central nervous system uses chemicals to transmit information between neurons. Drugs are taken to modify these chemical actions, either increasing, decreasing, or changing them.

**Overdose**

Any dose in excess of that which is therapeutically indicated. The term is more usually used to mean a high dose which produces hazardous and more intense effects than the user intends.

**Physical dependence**

A state of tolerance associated with chronic use, such that the body goes into a state of drug deprivation if the drug is withdrawn.

**Psychoactive drug**

Any drug which affects perception, emotions, thoughts, and/or behaviour.

**Psychological dependence**

A state characterized by an intense wish to use a substance, a pattern of compulsive administration, and a feeling of severe anxiety if the substance is unavailable.

**Receptor (target) sites**

Specific sites in the body where drug action takes place.

**Seizure**

A pattern of abnormal rhythmic electrical activity in the brain and its sequelae. The manifestations can be motor (i.e., as in convulsions), sensory, autonomic, or psychic.

**Tachyphylaxis**

A form of complete tolerance which develops rapidly to certain drugs (e.g., to many hallucinogens) either during the course of acute intoxication or when they are used every day; it is a state in which no additional doses of the drug will produce any effect until sensitivity is restored by a period of abstinence.

**Tolerance**

Reduced sensitivity to a drug resulting from the adaptation of the body to repeated exposure to that drug; thus, higher doses of the drug become necessary in order to maintain the original intensity of response.

**Withdrawal**

A set of physical symptoms and signs following the sudden cessation of any psychoactive substance after tolerance has developed. Generally, withdrawal symptoms are the reverse or opposite of the symptoms (effects) that the user seeks/feels on taking a given drug. Withdrawal symptoms vary somewhat from individual to individual for any given drug and may depend a good deal on personality traits and the emotional atmosphere of the immediate surroundings. The duration of withdrawal varies considerably from drug to drug depending on dose, duration of use, other pharmacological factors, and the type of drug taken. It is not possible to infer what drug has been used from observing withdrawal.

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